CONTRACT NO. 64594

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
303	129K	WINNEBAGO	585	267
STA.		TO STA.		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

TABLE OF BARS IN ONE HEADWALL

NOTE
The Total Length Of Bars v1 through v37 In The Names "C" Dimension Plus 2-0".

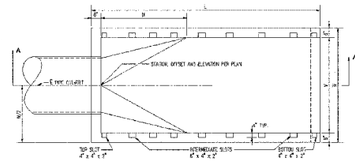
TABLE OF DIMENSIONS AND QUANTITIES

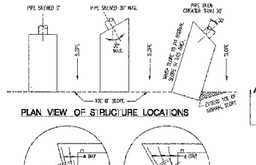
SKEW ANGLE	DESIGN NO.	PIPE DIA.	DIMENSIONS FOR STRUCTURE A	B	C	J	K	M	N	W	CU. YDS. CLASS X CONCRETE	BARS Z NO.	BARS Z MASS LBS.
25°	05-18-2	15"	3'-2"	8'-10"	2'-9"	7'-8"	8'-11"	8'-3"	4'-0"	11'-7"	8'-6"	4'-9"	0'-3"	45°-0"	15°	2.1	268
	05-18-2	18"	3'-3"	9'-1"	2'-9"	8'-1"	9'-2"	8'-6"	4'-3"	11'-10"	8'-9"	4'-9"	0'-3"	45°-0"	15°	2.2	282
	05-24-2	24"	3'-5"	9'-6"	2'-9"	8'-7"	9'-11"	8'-9"	4'-6"	12'-4"	9'-0"	4'-9"	0'-3"	45°-0"	15°	2.3	301
	05-30-2	30"	3'-6"	9'-11"	2'-9"	9'-1"	10'-8"	9'-1"	4'-9"	12'-11"	9'-3"	4'-9"	0'-3"	45°-0"	15°	2.4	320
	05-36-2	36"	3'-9"	10'-4"	2'-9"	9'-7"	11'-2"	9'-4"	5'-0"	13'-5"	9'-6"	4'-9"	0'-3"	45°-0"	15°	2.5	340
	05-42-2	42"	3'-9"	2'-2"	4'-3"	4'-9"	3'-10"	8'-1"	8'-1"	9'-3"	8'-4"	5'-0"	0'-3"	45°-0"	15°	11.5	650
	05-48-2	48"	3'-9"	2'-3"	4'-3"	5'-1"	3'-10"	8'-1"	8'-1"	9'-7"	8'-4"	5'-0"	0'-3"	45°-0"	15°	12.4	695
	05-54-2	54"	3'-9"	2'-4"	4'-3"	5'-4"	3'-10"	8'-1"	8'-1"	9'-10"	8'-4"	5'-0"	0'-3"	45°-0"	15°	13.2	740
	05-60-2	60"	3'-9"	2'-5"	4'-3"	5'-8"	3'-10"	8'-1"	8'-1"	10'-2"	8'-4"	5'-0"	0'-3"	45°-0"	15°	14.0	785
30°	05-18-2	15"	3'-2"	8'-10"	2'-5"	7'-10"	9'-0"	8'-4"	3'-9"	11'-7"	9'-0"	5'-0"	0'-3"	60°-0"	15°	2.1	236
	05-18-2	18"	3'-3"	9'-1"	2'-5"	8'-3"	9'-3"	8'-6"	3'-11"	11'-10"	9'-2"	5'-0"	0'-3"	60°-0"	15°	2.2	250
	05-24-2	24"	3'-5"	9'-6"	2'-5"	8'-9"	10'-0"	8'-9"	4'-2"	12'-4"	9'-5"	5'-0"	0'-3"	60°-0"	15°	2.3	269
	05-30-2	30"	3'-6"	9'-11"	2'-5"	9'-3"	10'-9"	9'-1"	4'-5"	12'-11"	9'-8"	5'-0"	0'-3"	60°-0"	15°	2.4	288
	05-36-2	36"	3'-9"	10'-4"	2'-5"	9'-9"	11'-3"	9'-4"	4'-8"	13'-5"	9'-11"	5'-0"	0'-3"	60°-0"	15°	2.5	308
	05-42-2	42"	3'-9"	2'-2"	4'-0"	4'-11"	3'-10"	8'-1"	8'-1"	9'-3"	8'-9"	5'-3"	0'-3"	60°-0"	15°	10.1	630
	05-48-2	48"	3'-9"	2'-3"	4'-0"	5'-3"	3'-10"	8'-1"	8'-1"	9'-7"	8'-9"	5'-3"	0'-3"	60°-0"	15°	11.3	695
	05-54-2	54"	3'-9"	2'-4"	4'-0"	5'-6"	3'-10"	8'-1"	8'-1"	9'-10"	8'-9"	5'-3"	0'-3"	60°-0"	15°	12.1	755
	05-60-2	60"	3'-9"	2'-5"	4'-0"	5'-10"	3'-10"	8'-1"	8'-1"	10'-2"	8'-9"	5'-3"	0'-3"	60°-0"	15°	10.9	670
45°	05-18-2	15"	3'-2"	8'-10"	2'-0"	8'-0"	9'-3"	8'-5"	1'-5"	11'-7"	9'-3"	5'-6"	0'-3"	45°-0"	15°-1/4	2.0	240
	05-18-2	18"	3'-3"	9'-1"	2'-0"	8'-5"	9'-6"	8'-7"	1'-6"	11'-10"	9'-4"	5'-6"	0'-3"	45°-0"	15°-1/4	2.1	254
	05-24-2	24"	3'-5"	9'-6"	2'-0"	8'-11"	10'-3"	8'-10"	1'-9"	12'-4"	9'-7"	5'-6"	0'-3"	45°-0"	15°-1/4	2.2	273
	05-30-2	30"	3'-6"	9'-11"	2'-0"	9'-5"	10'-11"	9'-3"	1'-11"	12'-11"	9'-10"	5'-6"	0'-3"	45°-0"	15°-1/4	2.3	292
	05-36-2	36"	3'-9"	10'-4"	2'-0"	9'-11"	11'-5"	9'-6"	2'-2"	13'-5"	10'-1"	5'-6"	0'-3"	45°-0"	15°-1/4	2.4	312
	05-42-2	42"	3'-9"	2'-2"	3'-9"	4'-6"	3'-10"	8'-1"	8'-1"	9'-3"	8'-11"	5'-9"	0'-3"	45°-0"	15°-1/4	9.8	610
	05-48-2	48"	3'-9"	2'-3"	3'-9"	4'-10"	3'-10"	8'-1"	8'-1"	9'-7"	8'-11"	5'-9"	0'-3"	45°-0"	15°-1/4	10.7	670
	05-54-2	54"	3'-9"	2'-4"	3'-9"	5'-1"	3'-10"	8'-1"	8'-1"	9'-10"	8'-11"	5'-9"	0'-3"	45°-0"	15°-1/4	11.5	730
	05-60-2	60"	3'-9"	2'-5"	3'-9"	5'-5"	3'-10"	8'-1"	8'-1"	10'-2"	8'-11"	5'-9"	0'-3"	45°-0"	15°-1/4	12.4	790

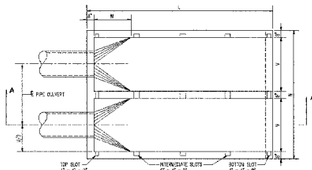
SEE STANDARD BRAIDING SD XX-7B (SHEET 1 OF 2) FOR NOTES.

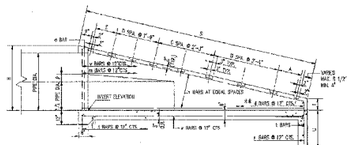
SHEET 2 OF 2

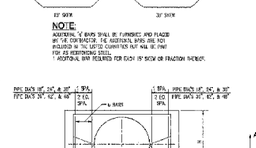
APPROVED	DATE	CTE ENGINEERS	THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY	REVISIONS NO.	DATE	DESCRIPTION	STANDARD SD 04-7B	DRAWING NO.
Jeff Bailey DIST ENGINEER	6-22-2004	CONSOER TOWNSEND ENVIRODYNE ENGINEERS, INC.	2700 OGDEN AVENUE DOWNERS GROVE, ILLINOIS 60515				SKEWED HEADWALLS	B15 OF

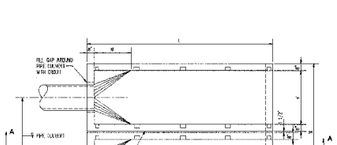










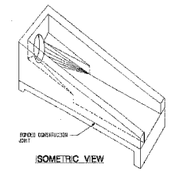


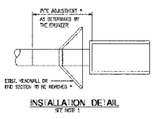
TWIN PIPE DESIGN

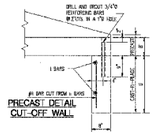
NOTES

1. THE HYDRAULIC EVALUATION, SHORTENING, MODIFICATION AND CUTTING SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR CONCRETE HEADWALLS AND CULVERTS (CLASS "X").
2. CLASS "X" CONCRETE SHALL BE USED THROUGHOUT.
3. REINFORCING STEEL SHALL BE DESIGNED TO BE FULLY EFFECTIVE TO RESIST ULTIMATE DESIGNATION LATERAL EARTH AND GRAVITY LOADS.
4. BAR BENDING DETAILS ARE TABULATED BUT TO BE OUT OF BARS.
5. ALL EXPOSED EDGES SHALL HAVE A 3/4" - 45° CHAMFER, CHAMFER ON VERTICAL EDGES SHALL BE CONTINUOUS IN MINIMUM OF ONE FOOT RELIEF TYPE REVERSE CHAMFER LINE.
6. CARE SHALL BE EXERCISED IN REMOVING ANY LENGTH OF EXISTING PIPE SO THE REMAINING PIPE IS UNDAMAGED AND FULLY FUNCTIONING.
7. ANY ADDITIONAL LENGTHS OF PIPE REQUIRED WILL BE PAID FOR BASED ON THE TYPE AND SIZE REQUIRED TO MATCH THE ORIGINAL INSTALLATION.
8. FOR DIMENSIONS AND QUANTITIES FOR SINGLE PIPE DESIGN SEE STANDARD SD 04-7B (SHEET 2 OF 2).
9. FOR DIMENSIONS AND QUANTITIES FOR CAST PIPE DESIGN SEE STANDARD SD 04-7B (SHEET 1 OF 2).
10. FOR STEEL BRACING DETAILS SEE STANDARDS SD XX-1B (SHEET 2 OF 2).
11. THE STATIONS, OFFSET AND PROFIT ELEVATION FOR "W" HEADWALL SHALL APPLY AT THE END OF THE CONVENTIONAL PIPE ANCHORS.

* ADJUSTMENT TO THE LENGTH OF PIPE AND REMOVAL OF THE EXISTING HEADWALL OR END SECTION MAY BE REQUIRED.







SHEET 1 OF 6

APPROVED	DATE	CTE ENGINEERS	THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY	REVISIONS NO.	DATE	DESCRIPTION	STANDARD SD 04-1B	DRAWING NO.
Jeff Bailey DIST ENGINEER	5-22-2004	CONSOER TOWNSEND ENVIRODYNE ENGINEERS, INC.	2700 OGDEN AVENUE DOWNERS GROVE, ILLINOIS 60515				HEADWALL TYPE III 18"-24"-30"-36"-42"-48" FOR 4:1, 6:1, AND 10:1 SLOPES	B14 OF

DIMENSIONS AND QUANTITIES IN ONE HEADWALL TYPE III 4:1 SLOPE

PIPE DIA.	DIMENSIONS B	L	W	P	S	T	U	V	W	A	T	NO. OF SPACES B	C	D	CONCRETE CLASS SP CU. YD.	REINF. STEEL LBS.
18"	2'-6"	7'-4"	2'-6"	3"	7'-8"	2'-0"	4'-4"	2'-7"	1'-8"	---	1	---	1.2	122
24"	2'-8"	10'-0"	2'-6"	3"	10'-1 3/4"	2"	2'-8"	4'-10"	2'-7"	2'-2"	---	2	---	2.8	269
30"	3'-2"	12'-8"	2'-6"	3"	12'-11 7/8"	2"	2'-8"	5'-3"	2'-7"	2'-8"	2'-8"	2	---	---	4.0	279
36"	3'-8"	15'-4"	2'-6"	3"	15'-5 1/4"	2"	2'-8"	5'-9"	2'-7"	3'-2"	3'-2"	2	---	4	5.3	339
42"	4'-2"	18'-0"	2'-6"	3"	18'-10"	2"	2'-8"	6'-3"	2'-7"	3'-8"	3'-8"	2	---	---	6.8	426
48"	4'-8"	20'-8"	2'-6"	3"	21'-4 3/4"	2"	2'-8"	6'-9"	2'-7"	4'-2"	4'-2"	2	---	4	8.2	513

DIMENSIONS AND QUANTITIES IN ONE HEADWALL TYPE III 6:1 SLOPE

PIPE DIA.	DIMENSIONS B	L	W	P	S	T	U	V	W	A	C	NO. OF SPACES D	G	CONCRETE CLASS SP CU. YD.	REINF. STEEL LBS.
18"	2'-6"	11'-6"	2'-6"	3"	11'-1 3/4"	2"	2'-8"	2'-0"	4'-4"	2'-7"	---	1	2	2.2	183
24"	2'-8"	15'-2"	2'-6"	3"	15'-3 1/4"	2"	2'-8"	2'-0"	4'-10"	2'-7"	2'-8"	3	---	2.8	278
30"	3'-2"	19'-2"	2'-6"	3"	19'-3"	2"	2'-8"	2'-0"	5'-3"	2'-7"	---	3	3	7.3	697
36"	3'-8"	23'-2"	2'-6"	3"	23'-1 1/2"	2"	2'-8"	2'-0"	5'-9"	2'-7"	---	3	3	7.3	697
42"	4'-2"	27'-2"	2'-6"	3"	26'-10"	2"	2'-8"	2'-0"	6'-3"	2'-7"	---	3	4	9.4	818
48"	4'-8"	31'-2"	2'-6"	3"	30'-10 1/2"	2"	2'-8"	2'-0"	6'-9"	2'-7"	---	3	5	11.3	727

DIMENSIONS AND QUANTITIES IN ONE HEADWALL TYPE III 10:1 SLOPE

PIPE DIA.	DIMENSIONS B	L	W	P	S	T	U	V	W	A	C	NO. OF SPACES D	G	CONCRETE CLASS SP CU. YD.	REINF. STEEL LBS.
18"	2'-6"	18'-0"	2'-6"	3"	18'-0"	2"	2'-8"	2'-0"	4'-4"	2'-7"	---	3	1	2.8	229
24"	2'-8"	23'-4"	2'-6"	3"	23'-3 1/4"	2"	2'-8"	2'-0"	4'-10"	2'-7"	---	4	1	3.8	334
30"	3'-2"	28'-8"	2'-6"	3"	28'-7 1/2"	2"	2'-8"	2'-0"	5'-3"	2'-7"	---	4	1	3.8	334
36"	3'-8"	34'-0"	2'-6"	3"	33'-11 3/4"	2"	2'-8"	2'-0"	5'-9"	2'-7"	---	4	2	8.2	610
42"	4'-2"	39'-4"	2'-6"	3"	39'-2"	2"	2'-8"	2'-0"	6'-3"	2'-7"	---	5	2	9.4	818
48"	4'-8"	44'-8"	2'-6"	3"	44'-6"	2"	2'-8"	2'-0"	6'-9"	2'-7"	---	5	3	11.3	727

REINFORCING BAR SCHEDULE FOR ONE HEADWALL TYPE III 4:1 SLOPE

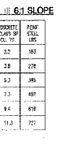
PIPE DIA.	NO. 4 REINFORCING BARS MARK	TYPE	NO. REQ'D.	LENGTH	a	b
18"	v58	1	1	9'-0"	7'-3"	---
	v59	7	20	6'-6"	1'-4"	8"
	v58	Str.	4	12'-8"	---	---
	v58	2	1	5'-0"	2'-0"	1'-0"
	v4	Str.	10	4'-0"	---	---
	v38	Str.	4	1'-10"	---	---
	v38	Str.	5	2'-10"	---	---
24"	v24	1	1	13'-8"	9'-8"	---
	v25	7	24	6'-6"	1'-4"	8"
	v24	Str.	4	15'-8"	---	---
	v24	Str.	13	6'-0"	---	---
	v24	Str.	18	6'-0"	---	---
	v24	Str.	4	7'-0"	---	---
	v25	3	8	2'-0"	1'-0"	2'-0"
	v25	Str.	1	2'-0"	---	---
30"	v30	1	1	17'-8"	13'-8"	---
	v30	7	28	6'-6"	1'-4"	8"
	v30	Str.	4	19'-8"	---	---
	v30	Str.	4	9'-0"	---	---
	v30	Str.	21	6'-0"	---	---
	v30	Str.	4	8'-0"	---	---
	v30	3	11	2'-0"	1'-0"	2'-0"
	v30	Str.	1	2'-0"	---	---
36"	v36	1	1	21'-8"	17'-8"	---
	v36	7	32	6'-6"	1'-4"	8"
	v36	Str.	4	23'-8"	---	---
	v36	Str.	8	12'-8"	---	---
	v36	Str.	25	6'-0"	---	---
	v36	Str.	4	9'-0"	---	---
	v36	3	14	2'-0"	1'-0"	2'-0"
	v36	Str.	1	2'-0"	---	---
42"	v42	1	1	25'-8"	21'-8"	---
	v42	7	36	6'-6"	1'-4"	8"
	v42	Str.	10	27'-8"	---	---
	v42	Str.	8	12'-8"	---	---
	v42	Str.	29	6'-0"	---	---
	v42	Str.	4	10'-0"	---	---
	v42	3	17	2'-0"	1'-0"	2'-0"
	v42	Str.	1	2'-0"	---	---
48"	v48	1	1	29'-8"	25'-8"	---
	v48	7	40	6'-6"	1'-4"	8"
	v48	Str.	10	31'-8"	---	---
	v48	Str.	8	12'-8"	---	---
	v48	Str.	33	6'-0"	---	---
	v48	Str.	4	11'-0"	---	---
	v48	3	20	2'-0"	1'-0"	2'-0"
	v48	Str.	1	2'-0"	---	---

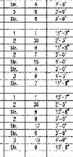
REINFORCING BAR SCHEDULE FOR ONE HEADWALL TYPE III 6:1 SLOPE

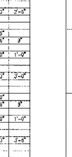
PIPE DIA.	NO. 4 REINFORCING BARS MARK	TYPE	NO. REQ'D.	LENGTH	a	b
18"	v58	1	1	9'-0"	7'-3"	---
	v59	7	20	6'-6"	1'-4"	8"
	v58	Str.	4	12'-8"	---	---
	v58	2	1	5'-0"	2'-0"	1'-0"
	v4	Str.	10	4'-0"	---	---
	v38	Str.	4	1'-10"	---	---
	v38	Str.	5	2'-10"	---	---
24"	v24	1	1	17'-8"	13'-8"	---
	v25	7	28	6'-6"	1'-4"	8"
	v24	Str.	4	19'-8"	---	---
	v24	Str.	13	6'-0"	---	---
	v24	Str.	18	6'-0"	---	---
	v24	Str.	4	9'-0"	---	---
	v25	3	8	2'-0"	1'-0"	2'-0"
	v25	Str.	1	2'-0"	---	---
30"	v30	1	1	21'-8"	17'-8"	---
	v30	7	32	6'-6"	1'-4"	8"
	v30	Str.	4	23'-8"	---	---
	v30	Str.	8	12'-8"	---	---
	v30	Str.	25	6'-0"	---	---
	v30	Str.	4	10'-0"	---	---
	v30	3	14	2'-0"	1'-0"	2'-0"
	v30	Str.	1	2'-0"	---	---
36"	v36	1	1	25'-8"	21'-8"	---
	v36	7	36	6'-6"	1'-4"	8"
	v36	Str.	10	27'-8"	---	---
	v36	Str.	8	12'-8"	---	---
	v36	Str.	29	6'-0"	---	---
	v36	Str.	4	11'-0"	---	---
	v36	3	17	2'-0"	1'-0"	2'-0"
	v36	Str.	1	2'-0"	---	---
42"	v42	1	1	29'-8"	25'-8"	---
	v42	7	40	6'-6"	1'-4"	8"
	v42	Str.	10	31'-8"	---	---
	v42	Str.	8	12'-8"	---	---
	v42	Str.	33	6'-0"	---	---
	v42	Str.	4	12'-0"	---	---
	v42	3	20	2'-0"	1'-0"	2'-0"
	v42	Str.	1	2'-0"	---	---
48"	v48	1	1	33'-8"	29'-8"	---
	v48	7	44	6'-6"	1'-4"	8"
	v48	Str.	10	35'-8"	---	---
	v48	Str.	8	12'-8"	---	---
	v48	Str.	37	6'-0"	---	---
	v48	Str.	4	13'-0"	---	---
	v48	3	23	2'-0"	1'-0"	2'-0"
	v48	Str.	1	2'-0"	---	---

REINFORCING BAR SCHEDULE FOR ONE HEADWALL TYPE III 10:1 SLOPE

PIPE DIA.	NO. 4 REINFORCING BARS MARK	TYPE	NO. REQ'D.	LENGTH	a	b
18"	v58	1	1	9'-0"	7'-3"	---
	v59	7	20	6'-6"	1'-4"	8"
	v58	Str.	4	12'-8"	---	---
	v58	2	1	5'-0"	2'-0"	1'-0"
	v4	Str.	10	4'-0"	---	---
	v38	Str.	4	1'-10"	---	---
	v38	Str.	5	2'-10"	---	---
24"	v24	1	1	17'-8"	13'-8"	---
	v25	7	28	6'-6"	1'-4"	8"
	v24	Str.	4	19'-8"	---	---
	v24	Str.	13	6'-0"	---	---
	v24	Str.	18	6'-0"	---	---
	v24	Str.	4	9'-0"	---	---
	v25	3	8	2'-0"	1'-0"	2'-0"
	v25	Str.	1	2'-0"	---	---
30"	v30	1	1	21'-8"	17'-8"	---
	v30	7	32	6'-6"	1'-4"	8"
	v30	Str.	4	23'-8"	---	---
	v30	Str.	8	12'-8"	---	---
	v30	Str.	25	6'-0"	---	---
	v30	Str.	4	10'-0"	---	---
	v30	3	14	2'-0"	1'-0"	2'-0"
	v30	Str.	1	2'-0"	---	---
36"	v36	1	1	25'-8"	21'-8"	---
	v36	7	36	6'-6"	1'-4"	8"
	v36	Str.	10	27'-8"	---	---
	v36	Str.	8	12'-8"	---	---
	v36	Str.	29	6'-0"	---	---
	v36	Str.	4	11'-0"	---	---
	v36	3	17	2'-0"	1'-0"	2'-0"
	v36	Str.	1	2'-0"	---	---
42"	v42	1	1	29'-8"	25'-8"	---
	v42	7	40	6'-6"	1'-4"	8"
	v42	Str.	10	31'-8"	---	---
	v42	Str.	8	12'-8"	---	---
	v42	Str.	33	6'-0"	---	---
	v42	Str.	4	12'-0"	---	---
	v42	3	20	2'-0"	1'-0"	2'-0"
	v42	Str.	1	2'-0"	---	---
48"	v48	1	1	33'-8"	29'-8"	---
	v48	7	44	6'-6"	1'-4"	8"
	v48	Str.	10	35'-8"	---	---
	v48	Str.	8	12'-8"	---	---
	v48	Str.	37	6'-0"	---	---
	v48	Str.	4	13'-0"	---	---
	v48	3	23	2'-0"	1'-0"	2'-0"
	v48	Str.	1	2'-0"	---	---







NOTES:
1. THE V BARS, TYPE 3, SHALL BE ORDERED FULL LENGTH AND CUT IN THE FIELD. THE ALTERNATE VERSION OF BAL 'V' BARS SHALL BE USED IN THE OTHER WALL.
2. THE LONG SIDE OF TYPE 'B' AND 'C' BARS SHALL BE VERTICAL.
3. QUANTITIES ON THIS DRAWING ARE USED ON ONE CAST-IN-PLACE DESIGN.
4. "Str" = STRAIGHT BAR
5. ALL REINFORCING BARS ARE #4 BARS

SINGLE PIPE DESIGN

SHEET 2 OF 6

APPROVED	DATE	CTE ENGINEERS	THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY	REVISIONS NO.	DATE	DESCRIPTION	STANDARD SD 04-1B	DRAWING NO.
Jeff Bailey DIST ENGINEER	5-22-2004	CONSOER TOWNSEND ENVIRODYNE ENGINEERS, INC.	2700 OGDEN AVENUE DOWNERS GROVE, ILLINOIS 60515				HEADWALL TYPE III 18"-24"-30"-36"-42"-48" FOR 4:1, 6:1, AND 10:1 SLOPES	B15 OF

REVISIONS NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION

ISTHA STANDARDS

SCALE: VERT. N/A
HORIZ. N/A
DATE SEPTEMBER 14, 2005

DRAWN BY KRL
CHECKED BY PDS